INDIANA DEPARTMENT OF TRANSPORTATION

INTER-DEPARTMENT COMMUNICATION

Standards Section – Room N642

Writer's Direct Line
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December 8, 2003

DESIGN MEMORANDUM No. 03-18
TECHNICAL ADVISORY

TO: **All Design, Operations, and District Personnel, and Consultants**

FROM: ***/s/ Anthony L. Uremovich***
Anthony L. Uremovich
Design Policy Engineer
Contracts and Construction Division

SUBJECT: **Guardrail at Culverts**

SUPERSEDES: ***Indiana Design Manual*** **Sections Described Below**

EFFECTIVE: **April 20, 2004, Letting**

Delete Section 49-3.03(01) Item 6 and replace it with the following:

6. Box Culverts or 3-Sided Structures. See Figure 49-3D$_1$, Clear Zone / Guardrail at Culverts, for acceptable options. The most cost-effective treatment should be considered.

Span	Rise	Option
≤ 3 m	All	A
> 3 m	< 1675 mm	A
> 3 m	≥ 1675 mm	B

A *Establish a clear zone for a distance L_R in advance of the structure. If this option is not cost-effective, guardrail should be placed.*

B *Guardrail should be placed.*

CLEAR ZONE / GUARDRAIL AT CULVERTS (Metric Units)

Figure 49-3D$_1$

Span	Rise	Option
≤ 10 ft	All	A
> 10 ft	< 66 in.	A
> 10 ft	≥ 66 in.	B

A *Establish a clear zone for a distance L_R in advance of the structure. If this option is not cost-effective, guardrail should be placed.*

B *Guardrail should be placed.*

CLEAR ZONE / GUARDRAIL AT CULVERTS (English Units)

Figure 49-3D$_1$

Removing sections of a box culvert and attaching metal circular or pipe arch adapters, a short section of metal culvert, and then an INDOT approved grated end section is also an option if the span is less than or equal to 1.5 m (5 ft).

Delete Section 55-5.03(02) Item 4 and replace it with the following:

4. If the point at which the top of the box culvert or 3-sided structure protrudes from the slope is within the obstruction free zone, guardrail should typically be provided. Otherwise, Figure 55-5A$_1$, Clear Zone / Guardrail at Culverts, should be used to determine the appropriate treatment.

Span	Rise	Treatment
≤ 3 m	All	B preferred; A acceptable
> 3 m	< 1675 mm	B preferred; A acceptable
> 3 m	≥ 1675 mm	B

A *Provide a clear zone with 6:1 slopes or flatter at least a distance L_R in advance and 30 m beyond the structure. Taper 10:1 on both sides of the structure to tie back in.*

B *Guardrail should be placed. Use treatment A if guardrail is impractical due to the close proximity of public road approaches or drives. Driveway grades should be designed to be compatible with clear-zone slopes. Driveway sideslopes should be10:1.*

CLEAR ZONE / GUARDRAIL AT CULVERTS (Metric Units)

Figure 55-5A$_1$

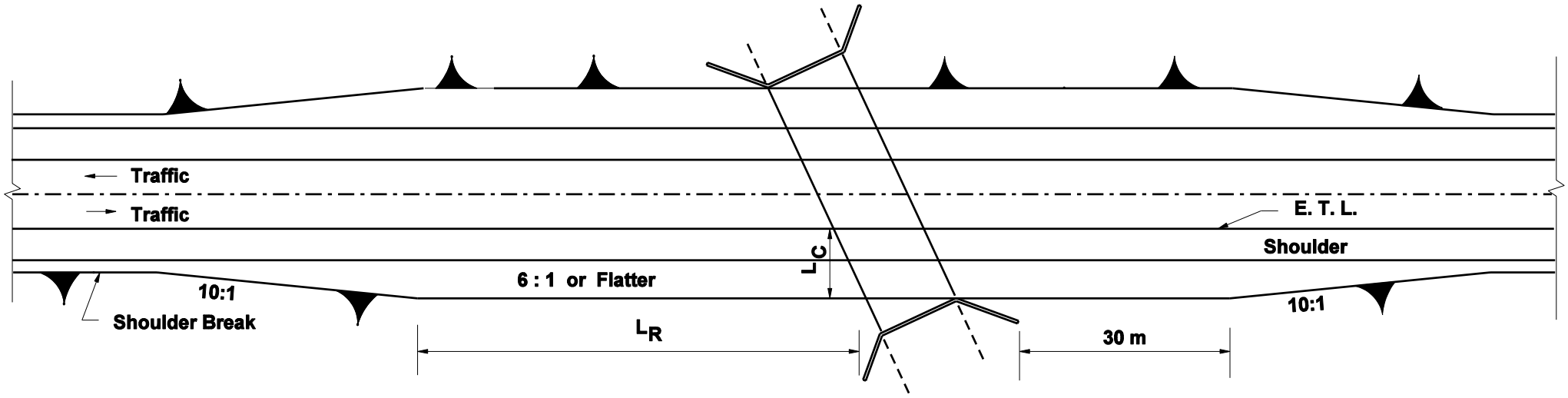
Span	Rise	Treatment
≤ 10 ft	All	B preferred; A acceptable
> 10 ft	< 66 in.	B preferred; A acceptable
> 10 ft	≥ 66 in.	B

A *Provide a clear zone with 6:1 slopes or flatter at least a distance L_R in advance and 30 m beyond the structure. Taper 10:1 on both sides of the structure to tie back in.*

B *Guardrail should be placed. Use treatment A if guardrail is impractical due to the close proximity of public road approaches or drives. Driveway grades should be designed to be compatible with clear-zone slopes. Driveway sideslopes should be10:1.*

CLEAR ZONE / GUARDRAIL AT CULVERTS (English Units)

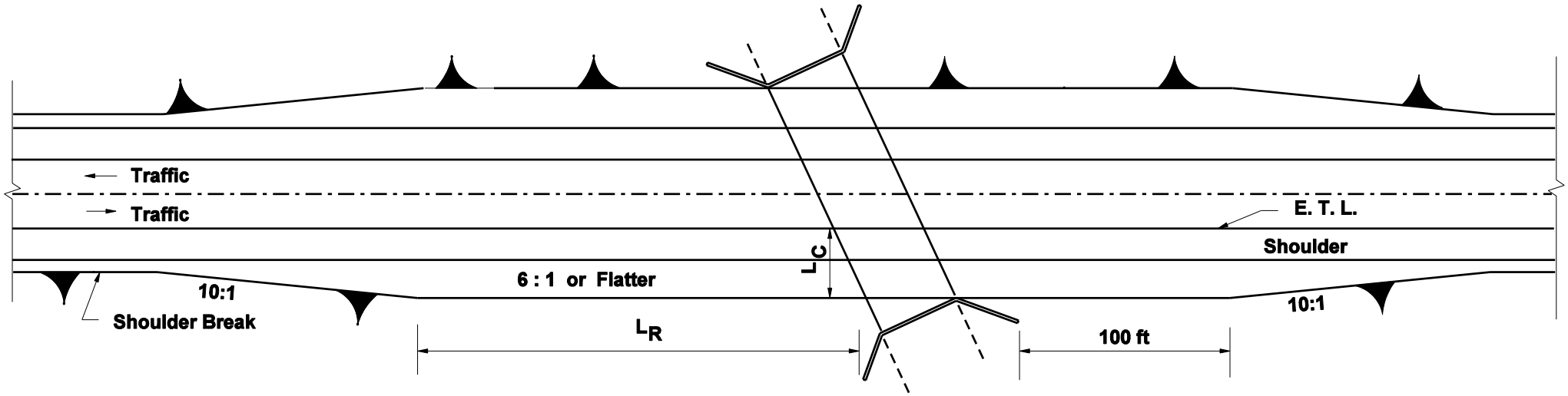
Figure 55-5A$_1$



L_R = Runout Length from Figure 49-5F

L_C = Clear Zone Distance from Figure 49-2A

LARGE DRAINAGE STRUCTURES WITH CLEAR ZONE
Figure 55-5B



L_R = Runout Length from Figure 49-5F

L_C = Clear Zone Distance from Figure 49-2A

LARGE DRAINAGE STRUCTURES WITH CLEAR ZONE
Figure 55-5B